

The Essential 5: Using Student Achievement Data to Support Instructional Decision Making Professional Development Lesson <u>Cycle of Improvement</u>		
<i>Step</i>	<i>Description</i>	<i>Time</i>
Materials Needed	Pencils, small, grade level groups, markers, chart paper	
Introduction	Use (slides # 1-5)	
View: Video: Multimedia Overview: Making Data Part of an Ongoing Cycle of Instructional Improvement.	(Slide # 6) Use this multimedia overview to learn about the 5 recommended practice to support the use of data to improve student achievement,	7:57 min.
Share	(Slide # 7,8) What are the key concepts of using data to improve instruction?	2-3 min.
View: Expert Interview Prepare, Inquire, Act	(Slide # 9)Use this video interview to show the cycle of improvement recommended by Dr. Liz City	7:34 min.
View and Compare	(Slide # 9) Show Video: Then compare the key ideas in the video to the Collaborative Teams document - Use the (Handout #1) Collaborative Teams document if desired	4-5 min.
Video: Expert Video, What Do You See in the Data?	(Slide #10) Listen to Dr. City talk about effective methods of using of data and ways to build capacity in data interpretation and designing instruction based on the data	6:31 min.

Practice	Review (Slides # 11-13) to set context for practice generating questions and testing our hypotheses Important: Select mock data to be used. Important to select relevant data used by district or school	20 min.
Audio 2 clips: 1.Supporting Use of Data During Teacher Collaboration Time video 2. Intervening Early Using Data From Multiple Assessments	(Slide #14-15) After viewing the two videos, discuss how they use multiple pieces of data in the cycle of improvement to support students needs	4:02 min.
		3:44 min
	Discussion portion	2-3 min
Compare	(Slides #16,17) Use (Handout # 2) Discuss multiple assessments shared during the videos compared to the Montana Rtl Assessment framework Jigsaw activity	15 min.
Application	(Slide #18) (Handout # 3) Use the Self Assessment Checklist to examine strengths and weaknesses of current assessment system and ability to use data to improve student achievement	20 min.
<u>Student Use of Data</u>		
<i>Step</i>	<i>Description</i>	<i>Time</i>
Materials Needed	Pencils, small groups, markers, chart paper	
Introduction	Slide # 19	1-2 min

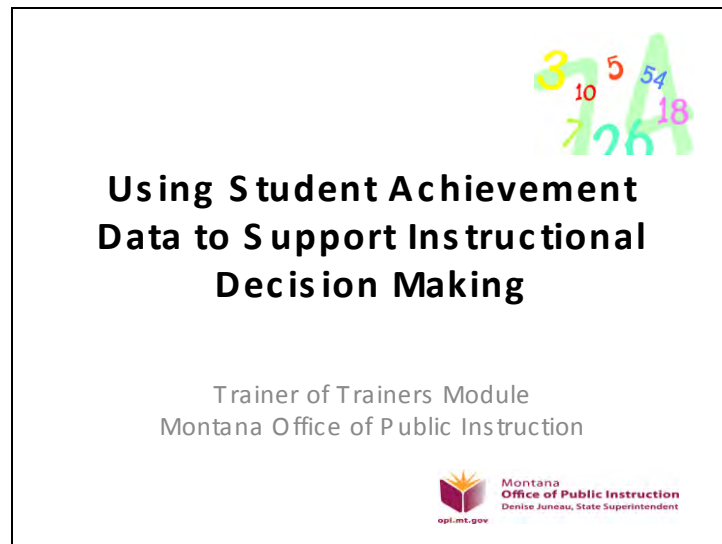
Introduce	(Slide #20) Introduce the Key concepts from the Student Use of Data recommendation	1-2
View: Multi Media Overview Teaching Students to Examine Their Own Data	(Slide # 21) View video to learn about ways teachers can engage students in using their own data	6:19 min
Share	(Slide # 22) Think –Pair-Share how they can incorporate student use of data in their current role	4-5 min
View: Expert Interview, Helping Students Gain Ownership Over Their Learning	(Slide #23) Listen for examples of ways to provide feedback to students when using their own data	4:54 min
Discuss	(Slide #24) Small Group discussion- Discuss the two questions on Slide	5 min
Application	(Slide #25) Use Handout # 4) Complete teacher self assessment individually and then do a Think Pair Share with a partner on strengths and areas to improve	10 min
View: Data Boards Help Students Set Learning Goals Part I	(Slide #26) Watch for ideas that could be implemented in your school	4:38
Discuss	(Slide #27) How could these ideas be implemented in your school? Chart small group answers	10 min
View: Data Boards Help Students Set Learning Goals Part II	(Slide # 28) Examine how teachers can use the data board for student reflection and goal setting	4:54
Discuss	(Slides #29, 30) Use (Handout # 5) Examine the student reflection	10 min

	sheets and discuss how they could be used in your school?	
View: <i>Go Back and Reflect</i>	Slide #30- View video	4:11
Discuss	Slide #31, Discuss ideas on the slide	5 min
<u>Vision For Data Use</u>		
<i>Step</i>	<i>Description</i>	<i>Time</i>
Materials	Chart paper, Markers, small groups, chart paper	
Introduction	Slide #32	1-2 min
Discuss	(Slide # 33) Share key concepts for the Vision Recommendation	1-2 min
View Expert Interview: <i>Collaborative Structures for Data Use</i>	(Slide #34) View video and listen for what portions of establishing a clear vision are present in your school.	5:44
Discuss	(Slide #35) Think-Share what portions of establishing a clear vision are in place in your school? Chart answers on table group chart paper	10 min
View Video: <i>Earning Trust</i>	(Slide # 36) Listen to a principal talk about the culture of trust that needs to be established	2:26
Discuss	(Slide # 37) Whole Group discussion	10 min
View	(Slide # 38) Use the video <i>Carrying Out the Vision</i>	2:41 min
Discuss	(Slide #39) Inside Outside Circle	29 min
Application	(Slide # 40) Use (Handout # 6) Small	15 minutes

	groups complete the chart from Learning Together. Information on chart is collected and put into one document for consideration by staff and leadership at a later meeting	
<u>Data Driven Culture</u>		
Steps	Description	Time
Materials	Pencils, small groups	
Introduction	(Slide #41)	1-2 min
Discuss	(Slide # 42) Key Concepts	1-2 min
View Video: <i>Multimedia Overview: Fostering a Data-Driven Culture Within a School</i>	(Slide # 43) Listen to the overview to learn how schools can provide support for developing a data driven culture	5.55 min
Discuss	(Slide # 44) Read and discuss (Handout #7)Providing Support for Teachers on the Montana Rtl website-jigsaw activity	21 min
View Video: <i>Expert Interview Supporting a Culture of Data Use</i>	(Slide #45) Listen to an expert talk about critical decisions and principles that can help support teachers in using data effectively	3:47
Discuss	(Slide # 46) Using the chart on slide, complete activity on supports currently in place and supports needed in the school	15 min
View Video: <i>Visualizing Data in the Progress Pad</i>	(Slide # 47) Show video and then do Think Pair Share	3:07 6min
Discuss	(Slide # 48) Using (Handout # 8) Section A of the Comprehensive	10 min

	Planning Tool: complete individually and then discuss at table groups/can be cross grade level or grade level groups	
Discuss	(Slide # 49)Now it's time to see what kind of professional development is needed to continue to improve in our (Handout #9) Use of Data. Examine professional development tool in small groups. Collect feedback and recording on sheets for later discussion and decision making	15 minutes
Districtwide Data System		
Steps	Description	Time
Materials	Markers, chart paper	
Introduction	(Slide # 50)	1-2 min
Discuss	(Slide # 51) Key Concepts	1-2 min
View Multimedia Overview: <i>Developing and Maintaining a Districtwide Data System</i>	(Slide # 52) Show video	5:28 min
View: Expert Interview <i>What Makes a High-Quality Districtwide Data System?</i>	(Slide # 53) Show video	5:31 min
Discuss	(Slide # 54) Use the (Handout #10) <i>Districtwide Data System Implementation and Staging Questions</i> document to foster conversation. Select	10 min

	one or two areas that are most pertinent to the district you are working with	
Listen to Audio: District Supports for Data Use	(Slide # 55) Listen to the audio to consider how a district can support data driven systems	3:35 min
Activity	(Slide # 56) Use the Dta Collection Planner, Using an Existing Data System to discuss current needs of the staff	25 min



Introduce yourself and the module

Say: This Train the Trainer Module is designed for using data: Using Student Achievement Data to Support Instructional Decision Making

As we work today I will be using a signal to let you know when discussion time is ending and that I need your attention up front.

Do: Model/practice signal you will use to bring the group back together after small group discussions and activities (ex: count down, hand raise, cue word).



Describe SLANT: You could show the routine card or chart out SLANT as you explain it. S is for sitting up, L is for leaning forward and showing interest in the speaker, A is for...

S = Sit up (good posture keeps you alert)

L = Lean forward (this shows interest to your speaker)

A = Ask questions (do this by raising your hand, putting the questions in your notes, and to yourself)

N = Nod your head (or else shake your head, or show your understanding or confusion in some other way)

T = Track your speaker (keep your eye on the speaker to take in important non-verbal clues and to stay alert and interested)

Give a quick reminder to have cell phones on silent mode

Discuss that conversations should be limited to partner or small group discussions as sidebar conversations can be distracting to those around you.

Go over when the scheduled breaks will be and where the restrooms are located.

No media

No handouts

Activity

- Think about an adjective that describes you that begins with the same letter your first name begins with
- Share with the group one at a time around the room



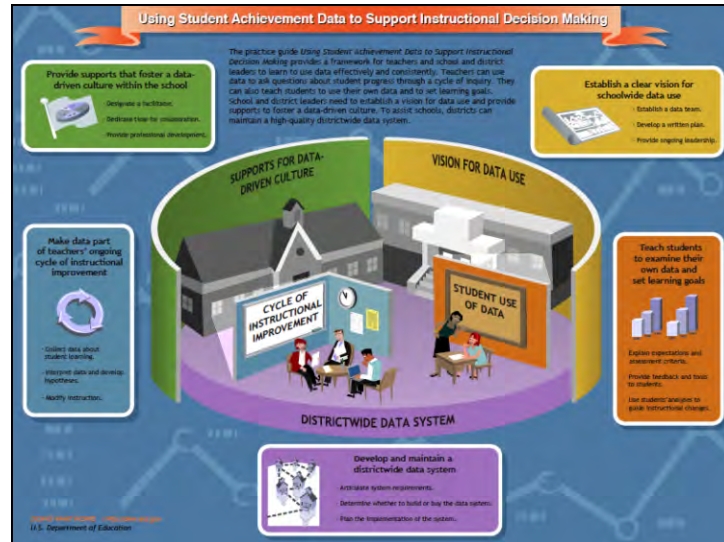
Read the slide to introduce the icebreaker activity.

Give examples with your name (2-3 examples). Delightful Debbie, Devious Debbie

Move quickly around the room and give feedback like nodding and restating adjective-names...) to make participants feel comfortable. Yes, Gleeful Gwen does describe you. Oh, I like Devious Debbie.

No media

No handouts



Say: This visual diagram illustrates five recommended practices based on the findings and recommendations presented in the IES Using Student Achievement Data to Support Instructional Decision Making Practice Guide.

The Inside circle represents the five areas of focus and alongside each area you will see the implementation recommendation from the IES guide. As you can see, each area of focus has a related recommended practice. (Purple to purple, green to green, etc.) Take just a minute to scan this diagram.

Schools may want to print a few of these out so they are easier to see.

DOINGWHATWORKS

Topic: Using Student Achievement Data to Support Instructional Decision Making (DDDM)

Practice: Establish a clear vision for schoolwide data use. (*Vision for Data Use*)

PRACTICE SUMMARY

Title/Media Type	Description
<i>Establishing a Clear Vision for Schoolwide Data Use</i> Multimedia Overview 5:31 min	<ul style="list-style-type: none"> A culture of data use in a school can ensure that data-based decisions are made frequently, consistently, and appropriately. This culture cannot develop, however, without a clear vision, developed among all staff, for schoolwide data use. A data team can clarify the school's vision for data use, model the use of data to make instructional decisions, and encourage and support other school staff to do the same. The schoolwide plan should clearly articulate how the school will use data to support school-level goals for improving student achievement. It reflects the concerns and needs uncovered through the data teams' discussions and other staff input. A crucial element to establishing a clear vision and using data effectively is having a common language around its use.

LEARN WHAT WORKS

Title/Media Type	Who	Description
<i>Collaborative Structures for Data Use</i> Expert Interview 5:44 min	Richard Halverson, Ph.D. University of Wisconsin-Madison	<ul style="list-style-type: none"> Dr. Halverson describes how schools need to integrate a data plan within the school's overall school improvement plan. A data plan can provide intermittent goals and specific steps needed to reach goals. Schools should consider data at multiple levels, from state assessment data to classroom and student-level data. A data team can facilitate implementation of the plan, provide leadership to change the school's culture, and guide a coordinated approach to systematic data use to support instructional decision making.

SEE HOW IT WORKS

Title/Media Type	Who	Description	Sample Material
<i>Establishing a Common Understanding</i> Audio Interview	Alexandra Pardo Thurgood Marshall Academy High School	A high school academic director talks about how the school defines key concepts that encompass the school's vision for data use including data, mastery, proficiency, and achievement.	No Sample Materials

Say: The materials used today will be from the Doing What Works Website as well as Montana Office of Public Instruction. The Doing What Works website follows a sequence that includes:

PRACTICE SUMMARY: An overview of the recommended practice

LEARN: learning what works with the given recommendation

SEE: an opportunity to see and hear example of how the recommendation works in actual schools

DO: activities that have been designed to support planning and application of the given recommendation

We will follow the same process today as we work together.

Media Overview: Transforming Teaching and Learning Through the Effective Use of Data



Say:

Watch this brief overview to learn about the purpose and recommendations in the Using Student Achievement Data to Improve Instructional Decision Making.

Find out why it's important for schools to focus on using student achievement results to make decisions and provide support for students.

Prior to showing the video: Ask: What are important aspects of using data in a school? Then, have the participants do a one minute quick write . After viewing the video, have participants adjust/add to/change their answer and share it with their partner (1 minute).

Media needed: *Transforming Teaching and Learning Through the Effective Use of Data*
Multimedia Overview (7:57 min.)

No handouts



Recommended Practice: *Make data a part of an ongoing cycle of instructional improvement*

Say: The first recommended practice in the IES Practice Guide is (read slide)

Key Concepts





- **Collect and prepare a variety of data about student learning**
- **Interpret data and develop hypotheses about how to improve student learning**
- **Modify instruction to test hypotheses and increase student learning**

Say: There are several key concepts related to the recommended practice. Introduce the key concepts and say that will be watching a video that discusses those key concepts.

Recommended Practice: *Make data a part of an ongoing cycle of instructional improvement*

LEARN:

- **View Expert Interview**
– *Prepare, Inquire, Act*
- Elizabeth A. City, Ed.D.
Harvard Graduate School of Education



After viewing video: Participants compare the key steps in Prepare, Inquire and Act and the Problem Solving Step in the Collaborative Teams document (steps: Defining the problem, Analyzing why it is occurring, Developing and implementing an intervention action plan, Monitor student progress and intervention fidelity, Evaluate intervention plan effectiveness, and Data-based decisions about intervention).

Activity:

Introduce activity by grouping participants (about 4 per group):

Say: For this activity each group will need the Collaborative Teams document from Montana Response to Intervention resources. Turn to page 2.

In your small groups I would like for you to look over the steps in the problem solving cycle used in Montana Response to Intervention and keep those steps in mind while we watch the next video. Please mark a check by the steps in the Collaborative Teams document and/or take a quick note if you hear the step referenced in the upcoming video.

Caution: Do not have participants read entire article. Only refer to and read page 2.

Say: So, as we can clearly see the steps within these two resources are very similar and cover the same processes for an ongoing cycle of instructional improvement.

Media: *Expert Video: Prepare, Inquire, Act* (7:34 min.)



Handout #1: MT Collaborative Teams document (pgs. 2)

Recommended Practice: *Make data a part of an ongoing cycle of instructional improvement*

LEARN: View Expert Interview

- Dr. Elizabeth City
- *What do you see in the data?*

Examining Data
Developing Questions
Noting Answers
Asking New Questions



Say: We will view another video by Dr. Elizabeth City. Dr. City suggests that teachers work collaboratively as they learn to use data efficiently in a cycle of instructional improvement. Dr. City offers examples of examining the data, developing questions, noting answers, and asking new questions until teachers reach an actionable step. (6:31 min)

Say: Please write on a big sticky note or piece of paper, these big ideas: Examining Data, Developing questions, Noting answers, Asking new questions, and Actionable steps. As you listen to Dr. City, add any additional information you would like to remember.

Media: *Expert Interview: What Do You See in the Data?*

Generating questions

- Examine assessment data and explain how you would interpret the data.
- What questions arise from data analysis (e.g., why are students having difficulty writing constructed responses on the benchmark assessment?).
- Use the five “why” questions discussed in the interview video to develop an actionable response.
- Generate questions until you arrive at an actionable question.



Say: This slide outlines the steps involved in examining the data to determine what may be causing the problem. Let's examine the example from Dr. City's interview. "We have students struggling to draw inferences"

First Why: Why are students struggling to draw inferences. We are not sure we are explicitly teaching inference.

Second Why: Okay, why are we not explicitly teaching inference.

Third Why: Well we are not sure we share a common definition of inference.

Fourth Why: Why don't we share a common definition of what inference is? Well, we haven't really done professional development on inference. We have focused on comprehension and we think inference might be different

Fifth Why: Okay, why haven't we done professional development on inference? Because we haven't allocated our time to that, so maybe if we did focus time on that we could allocate some pd time to that.



Think-Pair- Share- How does this process help get to the potential issue?

Provide 10 minutes for this activity

Next we will practice the step for asking the 5 why's with an example related to Montana

Generate Hypothesis/Instructional Changes

- Generate hypotheses that might explain the data and possible instructional changes to address the hypotheses.



Say: Activity: For this activity, we will use the question on the previous slide. “Why do our students have difficulty with constructed responses on the benchmark assessment?”

Example of 5 why's-

Why #1- Our students are not clear about what is expected of them on the assessment

Why # 2-We don't provide very many opportunities for students to receive feedback on constructed responses in our daily work

Why # 3- We don't have examples and rubrics to use for practice and examples

Why #4- We have never taken the time to gather materials and work together to learn to use the rubrics

Why # 5- We didn't know where to get examples and materials

Provide 10 minutes for this activity

Activity: Using the same data set. Practice with Steps 3 and 4



Step 4. Continue to generate the why questions until you come to a place where you could take an action

Materials: Released item sample

Grade 8 Montana Comprehensive Assessment System released items

Testing Our Hypotheses

- What forms of data can you use to test your hypotheses?
- Which student assignments or assessments will you use and why?



Let's look closely at the process so far:

Inquiry- Why are our students having difficulty with writing constructed responses on our state test?

What are our hypotheses?

Next we will think about how to test our hypotheses

Think, Pair, Share: What kinds of data could you use in your school to test if your hypotheses are correct?

Chart answers on large chart paper

If needed, share these ideas to contribute to the list they generate

Potential data to use:

We could use the released items from the MCAS and the rubrics with students.

We could bring our completed released items to our grade level meetings to score and examine together.



Say: Here is a sample of the Gr 8 Released items that could assist you in testing your hypotheses. Please take a minute to scan it and look at the rubric as well as the anchor papers.

Materials: Released item sample

Grade 8 Montana Comprehensive Assessment System released items

Recommended Practice: *Make data a part of an ongoing cycle of instructional improvement*

SEE: *Watch Supporting Use of Data During Teacher Collaboration Time video*



Say: We are going to watch two videos on how educators use multiple data in collaborative teaming. Listen carefully for types of data used. As you listen, please take quick notes on the various types of data used and how that data may or may not compare with data you have available in your school.

Media: *Supporting Use of Data During Teacher Collaboration Time* (4:02)

Recommended Practice: *Make data a part of an ongoing cycle of instructional improvement*

SEE: *Listen to Intervening Early Using Data From Multiple Assessments*



Montana
Office of Public Instruction
Denise Juneau, State Superintendent
opi.mt.gov

Say: Now we will listen to the second video related to using multiple pieces of data in collaborative teams to provide additional support to students

Media: *Intervening Early Using Data From Multiple Assessments* (3:44 min)

Now that we have seen some examples of ways to use multiple pieces of data, what other data could you use to answer your questions and test your hypotheses?

Components of a Comprehensive Assessment System

Components:

- Outcome
- Screening
- Diagnostic
- Progress Monitoring
- Informal

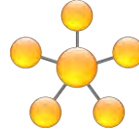


Say: In the Montana Response to Intervention Assessment Framework, there are clear definitions and descriptions of the multiple types of data to use.

For the next activity, please take out Montana's RtI Assessment Framework. Draw attention to the five components of a comprehensive assessment system.

Assessment in the Montana RtI Framework

- Examine the Montana RtI Assessment framework
- Jigsaw Activity
 - Read your section of the document
 - Key Question: What are the key **characteristics** of each component within the framework?



Jigsaw Activity: 15 minutes for this activity (3 minutes to read section, 2 minutes to share each key characteristic)

Conduct this activity in **cross grade level groups of 5**

Goal is to discuss the assessment system, regardless of grade level or content instruction

Each person on team reads one aspect of the assessment framework

Each person summarizes the key characteristics of their particular portion

Materials: Montana Assessment Framework (Handout # 2)

Implement a Cycle of Improvement

- **SELF-ASSESSMENT: CAN YOU COMPLETE THE CYCLE OF INSTRUCTION IMPROVEMENT**




 Montana
Office of Public Instruction
Denise Juneau, State Superintendent
opi.mt.gov

Say: This tool is designed to help district, and school leaders assess their processes for using data to improve instruction. We will be examining where you are currently in implementing a cycle of improvement in your school. This tool may be helpful in **assessing or strengthening** a data-driven cycle of instructional improvement, providing questions highlighting specific actions that can be part of the cycle. The tool draws on research-based guidance from *Data Use for Continuous Quality Improvement* (www.dataqualitycampaign.org/) to ensure effective data use. Additionally, the table provides space to record level notes and ideas for future action.

Material: Handouts #3 Self Assessment

Activity: Place participants in Grade level teams to work through the self assessment guide. (20 minutes)

Arrange teams in grade level teams.

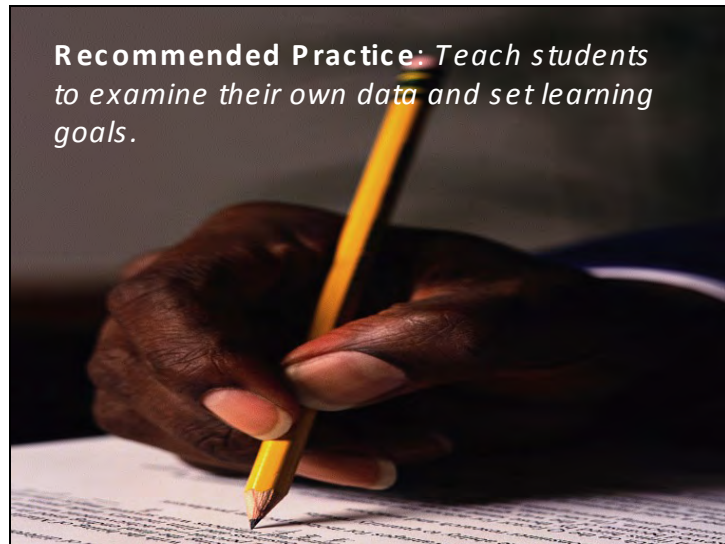
Middle or High Schools, arrange folks in department teams.

Complete the self assessment individually. Once you have done so, begin to discuss your results with your table groups.

Key discussion points,

In what areas are we strong?

In what areas do we need to take action to improve?



Say: The second recommended practice examines the benefits and challenges of teaching students to use data to monitor their progress and set learning goals.

Key Concepts



- **Explain expectations and assessment criteria**
- **Provide feedback to students that is timely, specific, well formatted, and constructive**
- **Provide tools that help students learn from feedback**
- **Use students' data to guide instructional changes**



Montana
Office of Public Instruction
Denise Juneau, State Superintendent
opi.mt.gov

Introduce the key concepts for this recommendation (1-2 min)

Recommended Practice: *Teach students to examine their own data and set learning goals.*

- **Multimedia Overview: Teaching Students to Examine Their Own Data**



Say: Students can learn to examine their own data, monitor their progress, and set learning goals when teachers set clear expectations, provide explicit feedback, and give students tools to understand the data. Rubrics, graphs, and charts help students understand the assessment criteria and allow teachers to provide constructive feedback.

Let's watch the Overview video of effective recommendations in teaching students to examine their own data and set learning goals. As we watch the video, list any examples that your school is currently doing.

Materials:

Multimedia Overview: Teaching Students to Examine Their Own Data (6:19)

Video Discussion



Say: Based on the video we just listened to you and your experience with using student data; discuss the following question with your partner on your left. (4-5 min)

Important point for trainers:

Choose one question based on audience, Coaches, teachers, leaders etc.

How can I help teachers create additional opportunities for students to analyze their own data to raise the rigor of the assessment?

How can I help teachers find instructional time to help students analyze their own data?"

How can I teach students to use data help in my classroom?

Recommended Practice: *Teach students to examine their own data and set learning goals.*

LEARN: Expert Interview: *Helping Students Gain Ownership Over Their Learning*



Say: As we watch an expert interview by Jonathan Supovitz, Ed.D. From the Consortium for Policy Research in Education at the University of Pennsylvania, list out the key points to consider when assisting students in using their own data.

Materials: Expert Interview: *Helping Students Gain Ownership Over Their Learning* (4:54)

Small Group Discussion



- What kind of feedback can be provided to students?

- What kind of tools can support students' self-assessment?



Use the talking chips activity for this table discussion. Each participant receives three chips (poker chips, pieces of papers, math cubes, etc.) and once they have contributed to the questions below, they place a chip in the middle of the table. Once their chips are gone, others need to contribute. This activity ensures that all participants voices are heard.

Say: With your table groups, discuss the following questions: (allow 5 min)

What kind of feedback can be provided to students?

What kind of tools can support students' self-assessment?

Important Trainer Point: Listen for some of the following responses. If you do not hear them in the group discussion, follow up after table talk and take a couple of minute to share them as your addition to the conversation.

What kind of feedback can be provided to students?

Feedback should relate to the student's performance in terms of specific individual goals and should be:

Timely – given quickly so students can integrate it correctly.

Appropriately formatted – individualized to meet the student's needs.

Specific and constructive – providing students with specific information and suggestions for improvement.

What kind of tools can support students' self-assessment?

Tools for providing feedback:

Rubrics



Say: Student self-assessment allows students the opportunity to evaluate their own learning progress. With the help of guided self-assessment, students can set goals, demonstrate gains in achievement, and acquire a sense of control over their educational outcomes. Instructional time should be budgeted to instruct and support students in using data to monitor progress and set goals.

Activity: Examine self assessment and complete it individually. Once complete, share with partner on your right. (10 min)

Materials:

Teacher Self Assessment Checklist

Materials: Handout # 4- Teacher Self Assessment: Student Use of Data

Recommended Practice: *Teach students to examine their own data and set learning goals.*

- **SEE:** *View Data Boards Help Students Set Learning Goals Part I*



Say: Now we will listen to a sixth-grade teacher explain how their school uses data boards. As you listen to this video, take notes of how this process could be implemented in your school/grade level.

Materials:

Media: *Data Boards Help Students Set Learning Goals Part I (4:38)*

Discussion

- How could this approach be implemented in your school, grade level to increase student motivation, and student use of data?



Think, Share with table group: How could this process be implemented in your school/grade level?

Activity: Chart answers of how this process could be implemented in your school/grade level. Share out with larger group.

Chart paper and Markers

Recommended Practice: *Teach students to examine their own data and set learning goals.*

SEE: View *Data Boards Help Students Set Learning Goals Part II*



Say: Now we will listen to the same sixth grade teacher engaging in a student goal setting session with one of her students. As you view this video, think of one student that would benefit from this process. Be prepared to discuss your thoughts.

Materials: *Data Boards Help Students Set Learning Goals Part II* (4:54 min)

Student Goal Setting Sheet

- Students can use this goal setting sheet on a regular basis to set goals and monitor progress
- Goal sheet should be modified to match the assessments used
- Works best with data from interim assessments



Say: Students can use this sample template to analyze data, reflect on their progress toward goals, identify areas for improvement, and write reflections. This template has two sections: an Academic Goal Reflection Organizer and an Academic Goal Reflection Sheet

Activity: Scan goal setting sheet and discuss how you might use this goal setting sheet.
(2-3 min)

Recommended Practice: *Teach students to examine their own data and set learning goals.*

SEE: View Video *Go Back and Reflect*



Say: Listen to a language arts teacher at a middle school describe the Data Analysis Booklets that students are required to complete. Form a T chart on a piece of paper and list challenges on one side of the T and benefits on the other side. Brainstorm with your table, challenges and benefits for implementing Data Analysis booklets.

As a presenter, sum up participants discussions that benefits would outweigh the challenges when we are thinking about increasing student achievement.

Materials: Media: *Go Back and Reflect* (4:11)

Student Use of Data Reflection

Based on our work together today,
share three confirmations, new
learning or goals to implement with
your partner



Montana
Office of Public Instruction
Denise Juneau, State Superintendent
opi.mt.gov



Say: The third recommendation focuses on establishing a clear vision for schoolwide data use. We will be discussing ways to build a data-driven vision and to foster discussion about the factors that contribute to a clear vision for data use at the school.

Key Concepts



- **Establish a schoolwide data team that sets the tone for ongoing data use**
- **Define critical teaching and learning concepts**
- **Develop a written plan that articulates activities, roles, and responsibilities**
- **Provide ongoing data leadership**



Montana
Office of Public Instruction
Denise Juneau, State Superintendent

opi.mt.gov

Introduce key concepts

Recommended Practice:
*Establish a clear vision for
schoolwide data*

- ***Expert Interview: Collaborative
Structures for Data Use***



Say: Now we will watch a video by Richard Halverson, Ph.D. of the University of Wisconsin – Madison in the School of Education

As you watch the video, take notes on what portions of establishing a clear vision are present and implemented in your school?

After viewing the video ...

Say: on your notes you should have these things listed for establishing a clear vision for implementing a schoolwide data plan (i.e.....) have participants check off the ones they have and add ones they may have missed.

Write this list on a chart paper and cover: Reveal when audio is over

Write a data plan

Ensure that there is classroom level and student level data

Principal provides vision on how to integrate that data into action

From data teams

Problem finding

Data reduction

Need time, resources and authority

Materials: Media: *Expert Interview: Collaborative Structures for Data Use* (5:44)

Small Group Discussion



What portions of establishing a clear vision are in place in your school?

After listening to the video, discuss this question (click for question to transition in).

(Allow 10 min)

Think-Share with your table groups: What portions of establishing a clear vision are in place in your school?

Discuss as a table group: chart responses on chart paper

Have each groups share out

Materials:

Chart paper and markers for each group

Recommended Practice:
*Establish a clear vision for
schoolwide data use*

- Listen to ***Earning Trust*** audio



Say: Now we will listen to an audio by Sara McClain from Thompson Elementary in Houston, TX.—

As you listen to the audio, take notes on why establishing trust might be important and what does the principal recommend in establishing and maintaining trust? You will want to refer to your notes in an upcoming group discussion.

Material:

Media: *Earning Trust* (2:26)

Whole Group Discussion

1. Why is it important to have trust, not only between the principal and teachers but also among teachers for instructional decision-making?
2. Why must teachers be able to communicate openly and work harmoniously in order to accomplish the school's goals?
3. Why do teachers need to understand the reasons behind a principal's push for results?
4. What is the best way for the administrative team and other teachers to support a teacher whose students are struggling?
5. How might establishing a culture of trust at your school affect the use of data to support instructional

Say: After listening to the audio interview, we are going to take a few minutes to discuss the following question together as a group: (click on slide to transition in questions).

Important Trainer Point: Select **One** of the questions to discuss as a whole group. Select the question that best fits the school you are working with.

1. Why is it important to have trust, not only between the principal and teachers but also among teachers for instructional decision-making?
2. Why must teachers be able to communicate openly and work harmoniously in order to accomplish the school's goals?
3. Why do teachers need to understand the reasons behind a principal's push for results?
4. What is the best way for the administrative team and other teachers to support a teacher whose students are struggling?
5. How might establishing a culture of trust at your school affect the use of data to support instructional decision-making process?

Recommended Practice:

*Establish a clear vision for
schoolwide data use*

- Watch ***Carrying Out the Vision*** video



Say: Next we'll listen to an audio of a principal describing staff participation in group data sessions where they target particular data and analyze it with student subgroups and objectives in mind. Please pay careful attention to the purpose of using data and how understanding the purpose of use of data shapes vision. You may want to take a few notes to refer to for an upcoming group discussion.

Materials:

Media: *Carrying Out the Vision* (2:41)

Inside/Outside Circle



After the interview, have participants arranged in an inside/outside circle (allow 20 minute for total activity)

Once participants each have a partner, say:

Say:

1. I am going to give you a discussion question.

Once I do that , please introduce yourself and then the inside partner will begin first.

After 2 minutes, I will raise my hand and please close your conversation.

At that time, the outside person may being to share their response to the question.

After 2 minutes, I will raise my hand again. Please close your conversation

Important Trainer Note: After both partners share, outside person takes one step to the right. Begin the process again with the second question. Repeat 3 more times to finish all of the questions.

1. What does the principal of Shotwell Elementary say is the purpose for using data at her school?

2. What are some other possible purposes for using data to make instructional decisions?

3. How can understanding the purpose for using data shape the vision for data-driven instructional decision making at your school?
4. How can this vision be carried out?

Next Steps for our school...

Components of a Data-Driven Vision	Steps for Administration	Steps for Teachers	Steps for the Data Team	Schoolwide Actions	What is YOUR role?
<i>Culture of trust</i>					
<i>Consistent and comprehensive communication about how to meet the identified needs of the students</i>					
<i>Collaboration time</i>					
<i>Data coach</i>					
<i>Professional development focused on data use</i>					


 Montana
 Office of Public Instruction
 Denise Juneau, State Superintendent

Next Steps

Use the table to lead participants in thinking about what components (e.g., a culture of trust, clear and regular communication) might contribute to a vision for data use at your school. . Participants can work in small groups to complete the table. The table includes example components that may contribute to developing a schoolwide vision for data use. Please have participants fill in as many components of a data-driven vision as they come up with. Insert extra rows as needed for this. Then, participants can complete the rest of the table as they think about action steps that can be taken to achieve the vision.

If desired, charts can be turned into leadership team as feedback and guidance for future work

Materials: Handout # 6- Next Steps chart



Say: Next we will examine the fourth recommendation which focuses on ways to build a data-driven culture and foster a culture of data use at the school.

Key Concepts



- **Designate a school-based facilitator who meets and collaborates with teacher teams in discussing data and solving problems**
- **Dedicate structured time for staff collaboration**
- **Provide targeted professional development regularly**



Montana
Office of Public Instruction
Denise Juneau, State Superintendent
opi.mt.gov

Introduce Key Concepts

Recommendation: Provide supports that foster data-driven culture within the school

Multi media overview: Fostering a Data-Driven Culture Within a School



Say: We are going to watch an overview of Fostering a Data Driven Culture within a School. List at least one or two of the concepts mentioned that you think would enhance what you are already doing?

Materials:

Media: *Multi Media Overview: Fostering a Data Driven Culture within a School* (5:55)

Providing support for teachers

- Review *Providing Support for Teacher Leaders*

Jennifer Henderson

- Jigsaw-Activity



Total of activity = 21 minutes

Say: Now that we have watched the video, let's compare it to the approach discussed in Handout #7. Please take out Handout # 7, this article is found on the RtI Resource page on the Montana OPI website. As you read, identify one point that is similar between the approach in the video and be prepared to share with your colleagues.

Please number your table from 1-4

#1's you will read from the beginning to the bottom of the intro

#2's you will read the section Building Positive Relationships

#3's you will read the section Distributing Power and Authority

#4's you will read the section Aligning Teacher Leadership with Teacher Learning and Creating a Positive Climate

You have 4 minutes to read your section and be prepared to share key points with your colleagues

Allow 4 min to read, 3 minutes for each sharing partner- total Jigsaw time= 16 min

Ask for sharing of important points by volunteers (5 min total)

Materials: Providing Support for Teacher Leaders article




Say: In watching the video by *Supporting a Culture of Data Use* (expert interview with Dr. Jeffrey C. Wayman), we will examine the need to provide supports to encourage teachers to use data. Support may come in the form of personnel, collaboration, and training. Takes notes about the different supports provided at your school and be prepared to use your notes to discuss what supports are provided, what additional supports are needed? And how can supports be modified and improved?

Materials:

Media: *Supporting a Culture of Data Use* (expert interview with Dr. Jeffrey C. Wayman)
(3:47 min)

What supports are provided?	What additional supports are needed?	How can supports be modified and improved?



Montana
Office of Public Instruction
Denise Juneau, State Superintendent
opi.mt.gov

Group Discussion: Option 2 (allow 15 min for processing and recording)

Depending on the time and needs of the school, guide the group discussion about ways the supports they already provide can be enhanced or modified to better align with their vision for a data driven culture.

Consider concluding by discussing steps participants can take to plan new or modified supports.

The group can also discuss ways they can seek staff input about needed supports. To organize key discussion points, participants can complete

Materials: Chart paper to record answers to the selected discussion questions

Recommendation: Provide supports that foster data-driven culture within the school

View Audio: *Visualizing Data in the Progress Pad*



Say: Let's listen to an audio interview with an elementary education director as she explains the room set aside to visually display student data. As you listen, you may want to draw a visual representation of how you think the progress pod looks.

Think- Pair- Share: Discuss with partner on your right, how might this be incorporated into your school? (Give 6 min for TPS conversation)

Materials:

Media: Audio- *Visualizing Data in the Progress Pad*- (3:07)



Total Activity= 25 minutes

Say: Districts and schools can use this comprehensive planning template to assess their use of data to support instructional decision making. We are going to use section A at this time. You may find it a worthwhile to use in other areas of your improvement efforts as well.

Activity:

Please take out the Comprehensive Planning tool and turn to section A.

Say: I am going to select #1 as an example.

#1. School leadership consistently demonstrates a commitment to data-driven instructional decision making.

In the box where is says Progress to Date, I am going to write **just beginning**.

In the Notes section I will write, We are implementing a new screening measure and a new math measure this year and the principal has given us only preliminary communication on what he expects and is committed to with the assessments.

Please complete this individually. Please jot notes or important thoughts in the far right box. **We are only doing section A at this time!**

In 5 minutes, we will share the individual recording with your table group.

It is time to share your individual recording with your table group. Please chart common points or points that you think are critical for the entire group to think about.

Say: I am going to chart two of the responses for table #1 as a model. Please label your chart with one column that says status and one column that says Notes. Table # 1, please share two of your individual responses for me to chart.

Materials:

Comprehensive Planning Tool

Chart paper and markers for each group



Say: As well as planning for effective use of data, it is also important to consider professional development needed in order to support teachers in implementation of a data-driven culture.

Activity: Please take out the Professional Development Assessment Tool. We are using Table 2 today for our activity. Please find Table 2.

Say: I am going to provide an example before you begin. As I scan the document I see # 3 and believe we have done a terrific job there. #3. *Are there opportunities for job-embedded training (e.g., modeling data analysis in a team meeting)?* I check the box regularly and then write in Teachers and principal in the participants section. In the actions section, I am going to write, *No Action needed*. That is my celebration and now I am going to scan to find my

Now, please complete the activity individual and then we will share those responses with your group.

Individually

Scan the document

In each category, select one area where you are doing a wonderful job of implementation

In each category, select one area that you think should be considered for future professional development work

With your table group

Share your area of celebration and your area to be considered for future work

On a **chart paper**, label the chart with **one column Celebrations** and **one column Areas to Consider**. Save those charts for leadership and those who make future professional development planning decisions.

Model one set of responses on the chart paper from table #2

Materials:

Professional Development Assessment Tool

Chart paper and markers for each group



Say: Next we will examine the fifth and final recommendation which focuses Developing and Maintaining a districtwide data system.

Key Concepts



- **Involve a variety of stakeholders in selecting a data system**
- **Clearly articulate system requirements relative to user needs.**
- **Determine whether to build or buy the data system.**
- **Plan and stage the implementation of the data system.**

Introduce Key Concepts

Recommended Practice: *Develop and maintain a districtwide data system*

- **View Multimedia Overview:** *Developing and Maintaining a Districtwide Data System*



Say: As we begin by watching a multimedia overview of critical factors in developing and maintaining a districtwide data system, please listen for important points a district should consider.

Think- Pair-Share, please share one or two points from the video that are important to consider when implementing a districtwide data system.

Materials:

Media: *Mutimedia Overview: Developing and Maintaining a Districtwide Data System*

Recommended Practice:
Develop and maintain a districtwide data system

- **View Expert Interview:** *What Makes a High-Quality Districtwide Data System?*



As we listen to the Expert Interview, please listen for characteristics of a high quality data system. At the end of the video, we will chart important characteristics so please jot down note as you listen.

Trainers: Prewrite the list on the chart and cover prior to video

Say: I have a list of important characteristics on this chart. Please look at the chart and check off the ones you have as well. Also, if you have a characteristic that I missed, please share it and I will add it to this chart.

Reveal the chart that was prewritten on the chart paper.

Important Trainer Point: Look for these charted points

Plan a staged roll out

Plan professional development

Involve all stakeholders

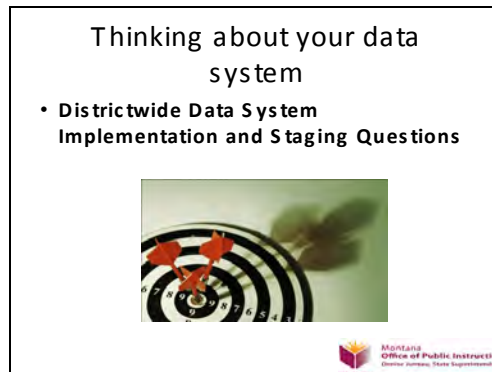
Establish a district counsel

Council members provide input to district

Allaying fears and resistance

Materials:

Media: *What Makes a High-Quality Districtwide Data System?* expert interview with Dr. Jeffrey C. Wayman (5:31)



Say: Let's take some time to look at a series of questions that help us develop and establish an effective districtwide data system that meets the needs of multiple stakeholders. (10 min)

Say: Please highlight a few questions that you would like to take to your next district data meeting.

Model: For example: Discussing the last three questions under the Training and Support section would be helpful for us because we haven't thoroughly planned our professional development sessions yet. These questions would help our district data team prepare effectively.

1. To what extent will training link the system's functionalities to strategies for meeting the district's teaching and learning goals?
2. To what extent will documentation and training be tailored to users' roles, professional experience, and familiarity with similar technologies?
3. What are the expectations for teachers' regular use of the system to access and analyze data to support instructional decision making?

Please individually identify particular questions that would be useful to discuss with your district data team to support a stronger data system in the future. (5 min)



Please record the questions on a chart paper from each individual participant to give to the district team. (10 min)

Materials:

Media: Districtwide Data System Implementation and Staging Questions document

Recommended Practice:
Develop and maintain a districtwide data system

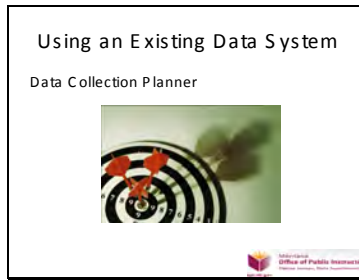
Audio: *District Supports for Data Use*



Say, we will now listen to an audio about ways districts can support the use of data

Materials:

Media: *District Supports for Data Use*



Say: Sometimes we have data systems that are being currently used and it is important to be sure they are doing what we need them to in order to effectively use data to improve student achievement.

Activity: Please take out Handout # 11. There questions to guide us at the top of the document. Now let's move down to the chart. This chart helps us think about important questions, record the findings of those questions and the potential actions that we want to take.

Let's take a look at the questions at the top of the handout. Please scan the questions at the top of the document

1. Are there parts of the database system that you don't know how to use or aren't aware of how they can be used?
2. What are your questions related to the different types of data that you can access?
3. Do you have questions about the skills needed to access and use the data?
4. Do you need to develop data reports or displays?
5. What kinds of decisions could one make using these data?

Say: Let's look at question #3. In completing the chart: What are some questions that may come up in relationship to #3. Some examples are: How do I log on? How do I pull up reports on my class? How do I pull up reports in individual students? How do I interpret the information on the data display? Now for the Findings section, through teacher interviews, it was found that teachers need more help on data interpretation.

We write that in the Findings section. As a result, our action will be to provide further professional development by the math coaches on data interpretation.

For today, we are going to work with Question #2. Please complete the chart using question #2 as the overarching idea and then fill in the underlying questions that relate to that overarching idea. (15 min)

When you return to your district, you might use these additional questions for future discussion and work.

Important Trainer Consideration: If using this section with district leaders. Consider using these questions from the Data Collection planner for discussion

1. What questions does the district want to answer with data?
2. What systems should be in place to support answering these questions?
3. What functionalities of the data system are teachers and administrators satisfied with and find helpful for their work?
4. What functionalities of the data system are teachers and administrators least satisfied with (e.g., generating graphs, disaggregating data by subgroups)?
5. Why are staff not satisfied with these functionalities?
6. What functionalities not available in the existing system should be included in the new data system (e.g., linking classrooms to specific teachers, integrating benchmark and state assessment data into reports)?

Materials

Data Collection Planner

Chart paper and markers for each table

Resources

- Doing What Works: <http://dww.ed.gov/>
 - http://dww.ed.gov/do/?T_ID=30&P_ID=79&t=2#tc
- Montana Office of Public Instruction
 - <http://opi.mt.gov/pub/RTI/EssentialComponents/AP/Reading/RTITools/ASSESSMENTS%20IN%20THE%20RTI%20FRAMEWORK.pdf>
 - <http://opi.mt.gov/pub/RTI/EssentialComponents/DBD/Present/Databased%20Decision%20Making%20and%20Problem%20Solving.pdf>



Using Student Achievement Data to Support Instructional Decision Making

Trainer of Trainers Module
Montana Office of Public Instruction



Group Norms

Listening: SLANT
Cell phone reminder
Conversations
Breaks



Bathroom location



Activity

- Think about an adjective that describes you that begins with the same letter your first name begins with
- Share with the group one at a time around the room





Recommended Practice: *Make data a part of an ongoing cycle of instructional improvement*

Key Concepts



- **Collect and prepare a variety of data about student learning**
- **Interpret data and develop hypotheses about how to improve student learning**
- **Modify instruction to test hypotheses and increase student learning**

Recommended Practice: *Make data a part of an ongoing cycle of instructional improvement*

LEARN:



- **View Expert Interview**
– *Prepare, Inquire, Act*

- Elizabeth A. City, Ed.D.
Harvard Graduate School of Education

Recommended Practice: *Make data a part of an ongoing cycle of instructional improvement*

LEARN: View Expert Interview

- Dr. Elizabeth City
- *What do you see in the data?*



**Examining Data
Developing Questions
Noting Answers
Asking New
Questions**

Generating questions

- Examine assessment data and explain how you would interpret the data.
- What questions arise from data analysis (e.g., why are students having difficulty writing constructed responses on the benchmark assessment?).
- Use the five “why” questions discussed in the interview video to develop an actionable response.
- Generate questions until you arrive at an actionable question.

Generate Hypothesis/Instructional Changes



- Generate hypotheses that might explain the data and possible instructional changes to address the hypotheses.

Testing Our Hypotheses

- What forms of data can you use to test your hypotheses?
- Which student assignments or assessments will you use and why?



Recommended Practice: *Make data a part of an ongoing cycle of instructional improvement*

SEE: Watch *Supporting Use of Data During Teacher Collaboration Time* video



Recommended Practice: *Make data a part of an ongoing cycle of instructional improvement*

SEE: Listen to *Intervening Early Using Data From Multiple Assessments*



Components of a Comprehensive Assessment System

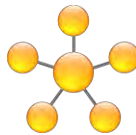
Components:

- Outcome
- Screening
- Diagnostic
- Progress Monitoring
- Informal



Assessment in the Montana RtI Framework

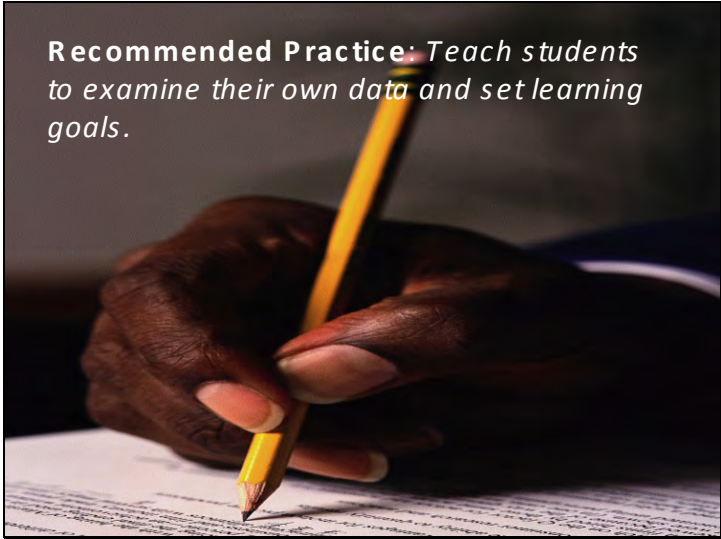
- Examine the Montana RtI Assessment framework
- Jigsaw Activity
 - Read your section of the document
 - Key Question: What are the key **characteristics** of each component within the framework?



Implement a Cycle of Improvement

- **SELF-ASSESSMENT: CAN YOU COMPLETE THE CYCLE OF INSTRUCTION IMPROVEMENT?**





Recommended Practice: *Teach students to examine their own data and set learning goals.*


Key Concepts




- Explain expectations and assessment criteria
- Provide feedback to students that is timely, specific, well formatted, and constructive
- Provide tools that help students learn from feedback
- Use students' data to guide instructional changes

Recommended Practice: *Teach students to examine their own data and set learning goals.*

- **Multimedia Overview: Teaching Students to Examine Their Own Data**



 Montana
Office of Public Instruction
Denise Juneau, State Superintendent
opi.mt.gov

Video Discussion



Recommended Practice: *Teach students to examine their own data and set learning goals.*

LEARN: Expert Interview: *Helping Students Gain Ownership Over Their Learning*



Small Group Discussion



- What kind of feedback can be provided to students?
- What kind of tools can support students' self-assessment?

Teacher Self Assessment

Teacher Self-Assessment: Supporting Students' Use of Data



Recommended Practice: *Teach students to examine their own data and set learning goals.*

- **SEE: View Data Boards Help Students Set Learning Goals Part I**



Discussion

- How could this approach be implemented in your school, grade level to increase student motivation, and student use of data?



Recommended Practice: *Teach students to examine their own data and set learning goals.*

SEE: *View Data Boards Help Students Set Learning Goals Part II*



Student Goal Setting Sheet

- Students can use this goal setting sheet on a regular basis to set goals and monitor progress
- Goal sheet should be modified to match the assessments used
- Works best with data from interim assessments

Recommended Practice: *Teach students to examine their own data and set learning goals.*

SEE: *View Video Go Back and Reflect*



Student Use of Data Reflection

Based on our work together today,
share three confirmations, new
learning or goals to implement with
your partner



Montana
Office of Public Instruction
Denise Juneau, State Superintendent
opi.mt.gov

Recommended Practice: *Establish a
clear vision for schoolwide data use*



Key Concepts



- Establish a schoolwide data team that sets the tone for ongoing data use
- Define critical teaching and learning concepts
- Develop a written plan that articulates activities, roles, and responsibilities
- Provide ongoing data leadership



Montana
Office of Public Instruction
Denise Juneau, State Superintendent
opi.mt.gov

Recommended Practice:
*Establish a clear vision for
schoolwide data*

- **Expert Interview: Collaborative Structures for Data Use**



Small Group Discussion



What portions of establishing a clear vision are in place in your school?

Recommended Practice:
*Establish a clear vision for
schoolwide data use*

- Listen to ***Earning Trust*** audio



Whole Group Discussion

1. Why is it important to have trust, not only between the principal and teachers but also among teachers for instructional decision-making?
2. Why must teachers be able to communicate openly and work harmoniously in order to accomplish the school's goals?
3. Why do teachers need to understand the reasons behind a principal's push for results?
4. What is the best way for the administrative team and other teachers to support a teacher whose students are struggling?
5. How might establishing a culture of trust at your school affect the use of data to support instructional

Recommended Practice:

Establish a clear vision for schoolwide data use

- Watch ***Carrying Out the Vision*** video



Inside/Outside Circle



Next 5 steps for our school...

Components of a Data-Driven Vision	Steps for Administration	Steps for Teachers	Steps for the Data Team	Schoolwide Actions	What is YOUR role?
Culture of trust					
Consistent and comprehensive communication about how to meet the identified needs of the students					
Collaboration time					
Data coach					
Professional development focused on data use					



Montana
Office of Public Instruction
Denise Juneau, State Superintendent

Recommended Practice: *Provide support that foster a data driven culture within the school*



Key Concepts



- Designate a school-based facilitator who meets and collaborates with teacher teams in discussing data and solving problems
- Dedicate structured time for staff collaboration
- Provide targeted professional development regularly



Montana
Office of Public Instruction
Denise Juneau, State Superintendent

Recommendation: Provide supports that foster data-driven culture within the school

Multi media overview: Fostering a Data-Driven Culture Within a School



Providing support for teachers

- Review ***Providing Support for Teacher Leaders***

Jennifer Henderson

- Jigsaw-Activity



Recommendation: Provide supports that foster data-driven culture within the school

View: Supporting a Culture of Data Use



What supports are provided?	What additional supports are needed?	How can supports be modified and improved?

Recommendation: Provide supports that foster data-driven culture within the school

View Audio: *Visualizing Data in the Progress Pad*



Comprehensive Planning Tool

Time to think about our future work...

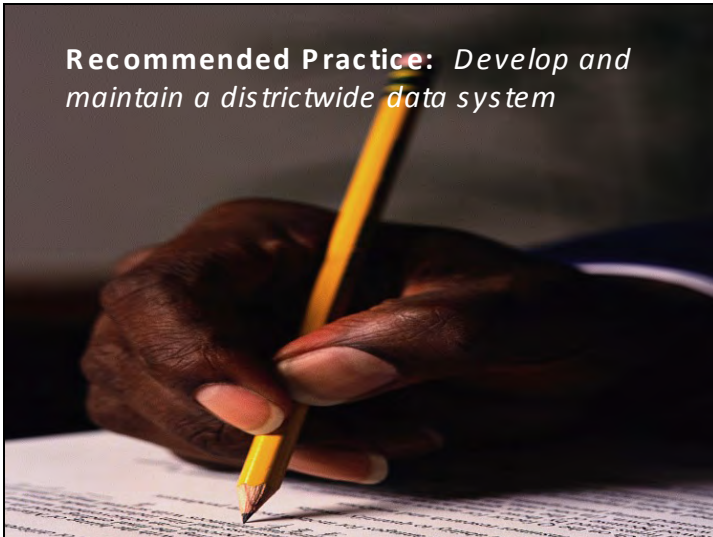


Examining Professional Development Needs

• PROFESSIONAL DEVELOPMENT ASSESSMENT TOOL



Recommended Practice: *Develop and maintain a districtwide data system*



Key Concepts



- Involve a variety of stakeholders in selecting a data system
- Clearly articulate system requirements relative to user needs.
- Determine whether to build or buy the data system.
- Plan and stage the implementation of the data system.

Recommended Practice: *Develop and maintain a districtwide data system*

- **View Multimedia Overview:** *Developing and Maintaining a Districtwide Data System*



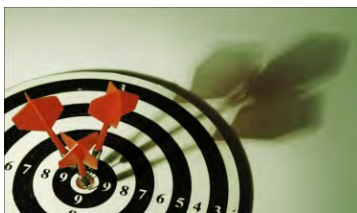
Recommended Practice:
Develop and maintain a districtwide data system

- **View Expert Interview:** *What Makes a High-Quality Districtwide Data System?*



Thinking about your data system

- **Districtwide Data System Implementation and Staging Questions**



Recommended Practice:

Develop and maintain a districtwide data system

Audio: District Supports for Data Use



Using an Existing Data System

Data Collection Planner



Resources

- Doing What Works: <http://dww.ed.gov/>
 - http://dww.ed.gov/do/?T_ID=30&P_ID=79&t=2#tc
- Montana Office of Public Instruction
 - http://opi.mt.gov/pub/RTI/EssentialComponents/A_P/Reading/RTITools/ASSESSMENTS%20IN%20THE%20RTI%20FRAMEWORK.pdf
 - <http://opi.mt.gov/pub/RTI/EssentialComponents/DBD/Presnt/Databased%20Decision%20Making%20and%20Problem%20Solving.pdf>
